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Conversation Training in Aphasia: A Single Case Study

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Abstract

PROBLEM:

Traditional treatment approaches in aphasia therapy focus on remediation of a specific linguistic impairment or cognitive process and restoration of language functions. These approaches expect that skills will generalize to everyday communication. However, preliminary findings do not present conclusive evidence of such generalization (Savage, Donovan, & Hoffman, 2014). Recently, there has been a growing interest in treatments that adhere to the Life Participation Approach to Aphasia (LPAA) (LPAA Project Group, 2008). Many of these treatments intervene at the conversational level and focus on changing behaviors within natural conversation rather than expecting linguistic skills to generalize to everyday communication (Simmons-Mackie, Savage, & Worrall, 2014). Most conversation-based therapies train a communication partner or the PWA and a communication partner together as a dyad. Very few studies have evaluated the effectiveness of conversation-based therapy for a PWA independent of a communication partner. Many PWAs do not have consistent communication partners and most aphasia therapy is conducted in one-on-one therapy sessions with the PWA (Simmons-Mackie, Savage, & Worrall, 2014). Therefore, the following study was completed to evaluate the effects of conversation training with a PWA independent of partner training.

PROCEDURE:

A single-subject research design was used to determine the effect of independent conversation training with a PWA on language, cognitive-linguistic skills, functional communication, quality of life, support and strain in the spousal relationship, and communicative effectiveness. Outcomes following independent conversation training were compared to outcomes following partner training. The PWA in the present study was a 69-year-old male stroke survivor with moderate expressive and receptive aphasia. The PWA's spouse was also included in the study and had received no prior partner training. Treatment block 1 consisted of conversation training with the PWA independent of partner training. In treatment block 2, this conversation training was withdrawn and the PWA's spouse received partner training. Standardized and criterion-referenced assessments were administered prior to and following each block of treatment. Treatment outcomes were analyzed using non-parametric statistics including two-proportions tests and paired-samples t-tests and subjective analyses including effect size changes and discourse analyses as detailed by Nicholas and Brookshire (1993).

FINDINGS:

Conversation training with a PWA independent of partner training resulted in significant gains in language, memory, functional communication skills, quality of life, and communicative effectiveness in discourse. Declines were seen in cognitive skills, quality of life, and language functions when conversation training with the PWA was withdrawn and partner training was provided to the PWA's spouse, suggesting partner training alone is not effective in maintaining or increasing gains. Direct conversation training with the PWA should be incorporated when training partners to maximize gains. Many of the gains were not maintained during follow-up testing indicating the need for further research to determine appropriate dosage for maintenance.

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Chapter 1: Introduction

Background

Aphasia is an acquired language disorder resulting from damage to the brain, most commonly caused by a stroke. Aphasia is characterized by deficits in both receptive and expressive language skills and impairments in communication modalities such as speaking, listening, reading, and writing. Symptoms will vary depending on the site of lesion. Broca's aphasia is typically caused by a lesion in the posterior part of the inferior frontal gyrus, the insula, and/or the frontal operculum. Characteristics of Broca's aphasia include non-fluent, effortful, and telegraphic speech. Repetition as well as reading and writing skills are often comprised. Auditory comprehension is a relative strength for individuals with Broca's aphasia, however, deficits may still be present (Papathanasiou, Coppens, & Potagas, 2013).

The communication deficits that accompany aphasia can significantly impact an individual's ability to engage in and maintain conversations. The ability to communicate plays an integral role in establishing and maintaining relationships, exchanging information, creating a self-identity, and managing emotional well-being (Simmons-Mackie, Savage, & Worrall, 2014). Conversation is the foundation of human interaction and human relationships (Armstrong & Mortensen, 2006). However, for persons with aphasia (PWAs), reduced language functioning resulting from aphasia can make engaging in conversation a difficult task. Decreased conversational abilities affect many aspects of an individual's life including his/her vocation and relationships with family and friends which in turn affect the individual's quality of life.

Strong communication skills are a requirement of many vocations. Communication difficulties can limit the job opportunities available to PWAs. Various studies have suggested that some PWAs successfully return to work following the stroke. However, very few return to

the same level of employment that had been held previously (Caporali & Basso, 2003; Hinckley, 2002; Morris, Franklin, & Menger, 2011). Employment status often contributes to an individual's well-being and life satisfaction, and unemployment can have a negative effect on perceived quality of life of a PWA (Vestling, Tufvesson, & Iwarsson, 2003).

Impaired communication not only impacts the employability of a PWA, but also affects interpersonal relationships with family and friends. Aphasia is complex and the ramifications of the disorder are not limited to only the individual with the aphasia diagnosis. Relatives and friends have reported frustration and stress when speaking with a PWA due to increased communication difficulties (Le Dorze & Brassard, 1995). Family members, oftentimes the spouse, may take on more responsibility as the PWA may no longer be able to complete the tasks that he/she was responsible for prior to the stroke. The spouse may stop pursuing hobbies or participating in social activities to devote more time and energy to caring for the PWA. These changes in relationships and responsibilities can negatively affect the PWA's self-image, social and emotional well-being, and quality of life (Herrmann & Wallesch, 1989).

Quality of life is defined as "individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (The WHOQOL Group, 1997, p. 1). Physical health, social and emotional well-being, psychological functioning, communication, independence, and relationships all factor into an individual's perceived quality of life (Cruice, Worrall, Hickson, & Murison, 2003). Research has shown that PWAs report having a significantly lower quality of life than individuals without brain damage (Cruice, Hill, Worrall, & Hickson, 2010). PWAs often state that less independence, decreased ability to perform activities of daily living, vocational

limitations, changes in relationships, and lack of accessibility to information and transportation contribute to lower quality of life (Ross & Wertz, 2003).

Over the last century, many treatment approaches and methods have been used by speech-language pathologists to address the communication needs of PWAs and thereby improve their quality of life.

Traditional Therapy

Aphasia therapy has traditionally focused on decreasing the severity of the impairment(s) and restoring language functions. One of the broad traditional therapy approaches is the stimulation approach. The stimulation approach relies on intensive auditory stimulation to reorganize and recover language functions (Coelho, Sinotte, & Duffy, 2008). It does not focus on teaching specific communication modalities. Rather, this approach aims to reorganize language by altering the structure and functioning of the brain (Coelho, Sinotte, & Duffy, 2008).

Another traditional approach to language intervention is the cognitive-linguistic approach. The goal of assessment and intervention is to identify the cognitive processes required to complete a language task, remediate the impaired processes, and teach compensatory strategies that utilize the intact processes. Specific modalities are not targeted in therapy. Rather, intervention targets individual steps in the cognitive process and assumes that improvements at this level will also produce gains in communication modalities (Hillis & Newhart, 2008).

These treatment approaches focus on remediation of a specific linguistic impairment or cognitive process and expect that the skills learned in intervention will generalize to everyday communication (Savage, Donovan, & Hoffman, 2014). A limited number of studies have evaluated the generalization of impairment-based therapies to conversational skills of PWAs. Preliminary findings do not present conclusive evidence that impairment-based therapy

spontaneously generalizes to conversation. However, results from small studies with a limited number of conversational samples do show that increases in production of content words, semantic specificity of nouns, and informativeness of speech output generalize to conversation (Boo & Rose, 2011; Carragher, Conroy, Sage, & Wilkinson, 2012; del Toro et al., 2008; Greenwood, Grassly, Hickin, & Best, 2010).

Conversation Therapy

Recently, with the shift in emphasis to activities and participation by the World Health Organization, there has been a growing interest in examining how participation restrictions in communication activities imposed by aphasia impact the quality of life of PWAs. The Life Participation Approach to Aphasia (LPAA) focuses on helping PWAs achieve their life goals and increase participation in daily activities (LPAA Project Group, 2008). Communication is essential for life participation, and conversation is considered to be the heart of human communication (Armstrong & Mortensen, 2006). Therefore, many treatments that adhere to the core values of the LPAA intervene at the conversational level. Rather than expect that linguistic skills will generalize to everyday communication, conversation-based therapy focuses on changing behaviors within natural conversation (Simmons-Mackie, Savage, & Worrall, 2014).

The majority of studies that intervene at the conversational level train communication partners to improve accessibility for PWAs in everyday communication. Intervention that focuses on training communication partners assumes that conversation is reciprocal and collaborative and that improvements in the communicative abilities of the partner without aphasia will improve the communication of the PWA (Kagan, Black, Duchan, Simmons-Mackie, & Square, 2001). According to Kagan et al. (2001), conversation partner training programs are

designed to help the partner acknowledge and better reveal the communication competence of the PWA.

Partner training often involves training communication partners without the PWA present. A variety of partners have been trained including familiar conversation partners such as a spouse or relative or unfamiliar conversation partners such as community volunteers. Studies that train familiar conversation partners have shown enhanced communication skills of the partner following training as demonstrated by a decrease in the partner's use of nonfacilitative behaviors (e.g. interrupting, asking questions that required one-word responses) (Simmons-Mackie, Kearns, & Potechin, 2005). Conversation partners have also shown increased understanding of the nature of aphasia following training (Blom Johansson, Carlsson, Östberg, & Sonnander, 2013). PWAs may also benefit from partner training even though intervention focuses solely on changing the behaviors of the communication partner rather than the behaviors of the PWA. One participant with aphasia in a single-subject study showed a significant increase in the number of verbal responses produced and in the average length of verbal responses following partner training intervention (Simmons-Mackie, Kearns, & Potechin, 2005). This provides preliminary evidence that training communication partners not only enhances the communicative skills of the partner but also that improvements generalize and increase the communication abilities of the PWA.

Similar results have been shown when unfamiliar volunteers participate in partner training. In many studies, volunteers participated in a conversational training program and then met weekly with a PWA and engaged in conversation. The PWAs showed increased verbal production of comprehensible utterances, enhanced communication skills needed for daily activities, and decreased aphasia severity following partner training. Many of the PWAs also

reported increased psychosocial wellbeing and confidence (Hickey, Bourgeois, & Olswang, 2004; McVicker, Parr, Pound, & Duchan, 2009; Worrall & Yiu, 2000).

Another approach to partner training involves working with a dyad consisting of the PWA and a communication partner. The focus is not solely on training the communication partner but rather on changing the behaviors of both the partner and the PWA to improve communication. In this approach, communication partners are taught strategies to support the PWA and to increase the number of successful conversational turns. Examples of these strategies include giving the PWA additional time to respond, decreasing speaking rate, using fewer words per minute, limiting the number of interruptions, asking specific questions, writing down information, and summarizing and paraphrasing information frequently to check understanding (Beeke, Maxim, Best, & Cooper, 2011; Boles, 1998; Cunningham & Ward, 2003; Hopper, Holland, & Rewega, 2002).

The PWAs are taught strategies to increase the number of successful talking turns which increases the likelihood that their message will be understood by the communication partner. Some strategies include using a keyword in the turn-initial position, utilizing multi-modality communication strategies, appropriately initiating topics, or using behaviors to signal a turn continuation (Beckley, Best, Johnson, Edwards, Maxim, & Beeke, 2013; Beeke, Maxim, Best, & Cooper, 2011; Wilkinson, Bryan, Lock, & Sage, 2010; Wilkinson, Lock, Bryan, & Sage, 2011). Dyad training approaches have been found to be effective in changing the behaviors of the communication partner and of the PWA. Both the partners and the PWAs showed an increase in the use of the strategies targeted in therapy following intervention (Beeke, Maxim, Best, & Cooper, 2011; Boles, 1998; Wilkinson, Bryan, Lock, & Sage, 2010). Communicative effectiveness also improved as evidenced by an increase in the number of successful repairs of

communication breakdowns between the dyad, a decrease in the number of trouble sources (i.e. blockages in interaction), and an increase in the number of main concepts communicated (Cunningham & Ward, 2003; Hopper, Holland, & Rewega, 2002). The PWAs also showed improvements in communication by increasing the number of conversational repairs they initiated, producing more successful topic initiation turns, using multi-modality communication more frequently, increasing the number of words produced per minute, and taking a more active role in conversation (Boles, 1998; Cunningham & Ward, 2003; Wilkinson, Bryan, Lock, & Sage, 2010; Wilkinson, Lock, Bryan, & Sage, 2011). The PWAs reported a decrease in perceived level of impairment and improved psychosocial well-being, functional communication, and communication readiness and use through self-rating measures (Beckley, Best, Johnson, Edwards, Maxim, & Beeke, 2013; Boles, 1998). The available research suggests that dyad training approaches produce behavioral changes that enhance conversation between the PWA and a communication partner.

These studies involve training a communication partner without the PWA present or training the communication partner and the PWA together as a dyad. Very few studies have evaluated the effectiveness of conversation-based therapy with the PWA independent of a communication partner. In a qualitative review of conversation therapy in aphasia, Simmons-Mackie, Savage, and Worrall (2014) found only five studies published between 1950 and 2013 that evaluated conversation therapy directed specifically at the PWA. Three of these studies provided conversation therapy in a group setting. A study by Elman and Bernstein-Ellis (1999) included 26 participants with aphasia who were randomly assigned to two different treatment conditions. Half of the participants received immediate group therapy, and the other half served as the control group and received group therapy following the completion of the study.

Participants assigned to the treatment group were divided into two smaller groups consisting of seven participants. Group therapy was provided to the participants for five hours each week (2 ½ hour sessions twice a week) for four months. Intervention focused on improving the ability of the PWAs to convey messages using whichever communication strategy was most effective, initiating conversational exchanges, increasing understanding of aphasia, becoming more aware of personal goals and progress toward goals, and increasing communicative confidence. These goals were achieved through instructional techniques used by the clinician such as modeling communicative drawing, providing resources, prompting conversation, requesting increased participation, or sharing the leader role throughout the session (Elman & Bernstein-Ellis, 1999). Following group treatment, participants showed an increase in the Aphasia Quotient on the Western Aphasia Battery (WAB) as well as an improvement of scores on the Communication Abilities of Daily Living-Second Edition (CADL-2). Seven of the twelve participants who received group therapy showed clinically significant changes (an improvement of at least 5 points) on the WAB Aphasia Quotient (Elman & Bernstein-Ellis, 1999). These results suggest that group conversation therapy targeting the conversational skills of the PWA contributes to improvements in language and in functional communication abilities.

Ross, Winslow, Marchant, and Brumfitt (2006) also conducted a study that evaluated conversation therapy for PWAs in a group setting. Seven participants with moderate aphasia participated in one two-hour session each week for 11 weeks. The goal of the group intervention was to help the PWAs develop total communication and conversation skills, understand legal disability rights, and participate in social environments. A discussion about the specific conversation strategies taught to the PWAs was not provided in the article (Ross, Winslow, Marchant, & Brumfitt, 2006). Following group intervention, participants rated their perceived

conversation abilities (e.g. linguistic impairments, use of conversation management strategies such as repair or turn taking) using the Conversational Analysis Profile for People with Aphasia Part A (CAPPA A) and their perceived conversation experiences (e.g. styles of conversation, people spoken to, conversation topics) using the CAPPA Part B (CAPPA B). Pre- and post-treatment ratings were compared. Participants reported an increase in perceived conversation abilities. However, the group mean change was not statistically significant. Changes in scores varied significantly between participants with some showing decreases in perceived communication abilities and others showing improvements. Comparison of pre- and post-treatment ratings of conversation experiences on the CAPPA B showed a significant improvement in current conversation experiences meaning that experiences are moving toward what they were prior to the stroke. Changes in perceived levels of anxiety and/or depression and self-esteem were not significant (Ross, Winslow, Marchant, & Brumfitt, 2006). These results indicate that group conversation therapy contributes to statistically significant benefits in perceived conversation experiences, specifically related to life participation. Other outcome measures did not show statistical significance likely due to a small sample size and individual participation variation. Individual participants did show improvements in perceived conversation abilities and psychosocial well-being.

In yet another study, Simmons-Mackie, Elman, Holland, and Damico (2007) evaluated the use of conversation training for PWAs in a group setting. Six group therapy sessions including four to ten participants in each group were evaluated to determine which discourse management strategies were used by the clinicians and how discourse was achieved in the group setting. Clinicians used a variety of strategies to encourage discourse from the PWAs that included seeking the opinions of the PWAs, being flexible in the topics discussed to keep

conversation natural, using multi-modality communication, and allocating turns by using requests and minimal turn lengths (Simmons-Mackie, Elman, Holland, & Damico, 2007). Clinicians modeled appropriate conversational behaviors, but a summary of how these skills were explicitly taught to the PWAs was not provided. The purpose of the study was to evaluate the use of strategies by the clinicians rather than evaluate treatment effectiveness. Therefore, no treatment outcomes for the PWAs are reported.

Efficacy of Individual Conversation Therapy

These studies show how conversation therapy directed at the PWA can be conducted in a group setting. Only two studies have evaluated the effectiveness of conversation-based intervention during individual therapy sessions with a PWA. Basso (2010) explains a treatment for individuals with severe aphasia using natural conversations and measures the effectiveness of the treatment using a single-subject design. Basso states that PWAs must maintain turn-taking abilities before therapy at the conversational level can be implemented. One participant with severe global aphasia was included in the study. The participant was unable to participate in any situation that required turn taking. Therapy was provided for two hours each day for three months and focused on increasing turn-taking behaviors for the participant. The PWA was asked to repeat single words during therapy to become accustomed to verbal productions (Basso, 2010). After three months of therapy targeting turn-taking behaviors, the clinician engaged in conversations with the participant. Maximum clinician support was required in these interactions. At the end of the study, the participant showed increased comprehension and vocabulary. Qualitatively, the participant's wife stated that the PWA was more motivated to talk with others and had reestablished friendships. In addition, the PWA was able to introduce a new conversational topic and convey simple thoughts in conversation (Basso, 2010). These results

indicate that conversation therapy that focuses on increasing the number of turn-taking behaviors of a PWA can produce improvements in language and life participation.

Savage, Donovan, and Hoffman (2014) also conducted a single-subject study to evaluate outcomes of conversation therapy directed at the PWA during individual therapy sessions with a speech-language pathologist. This study compared the effects of stimulation therapy and the effects of conversation-based therapy on conversational outcome measures. The researchers employed a single-subject alternative treatment design across the two participants to determine the treatment effect. Two PWAs with anomic aphasia participated in the study. One participant had mild aphasia and the other had moderate aphasia based on scores from the WAB-R. The participants received two 60-minute therapy sessions twice a week for five weeks for each treatment method. Stimulation therapy targeted auditory comprehension, lexical retrieval, and syntax. Conversation therapy focused on improving conversational behaviors that were most important for each participant. Examples of conversation goals targeted include expanding utterances, spontaneously introducing a new topic, using word retrieval strategies, or asking wh-questions (Savage, Donovan, & Hoffman, 2014). Outcomes were measured by recording conversation samples. The responses of the PWAs were analyzed for communication units (C-units) and Correct Information Units (CIUs). The PWAs' discourse was also coded for pragmatic function using the Conversational Interaction Coding Form (CICF) that evaluates CIUs and turn-taking. Secondary outcomes measures included the WAB, ASHA Functional Assessment of Communication Skills (ASHA FACS), Stroke and Aphasia Quality of Life Scale, and Conversational Profile for People with Aphasia (CAPPA). These measures were administered to assess changes in impairment, activity, and participation. Participant 1 received stimulation therapy followed by conversation therapy. Participant 1 showed a large treatment effect for

increased facilitative conversational interactions and for decreased non-facilitative conversational interactions following stimulation therapy. No significant effects were shown when comparing post-stimulation therapy data to post-conversation therapy data. However, the highest level of facilitative interactions and the lowest level of non-facilitative interactions were achieved during conversation therapy. This may suggest that stimulation therapy is not necessary to produce gains in conversation or that stimulation therapy is beneficial when implemented before conversation therapy and contributes to increased conversational skills (Savage, Donovan, & Hoffman, 2014). Participant 2 received conversation therapy before stimulation therapy. Participant 2 showed a large treatment effect for increased facilitative interactions and a large treatment effect for decreased non-facilitative interactions following conversation therapy, supporting the hypothesis that conversation therapy directed at PWAs can produce significant improvements in conversational skills (Savage, Donovan, & Hoffman, 2014).

Statement of Purpose

The purpose of the current study is to evaluate the effectiveness of a conversation training program directed at a PWA independent of partner training and to compare the outcomes to partner training alone. Previous research demonstrates that PWAs show improvements in language function and psychosocial well-being when communication partners receive partner training without the PWA present. Similar gains are also seen when the communication partner and the PWA are trained together as a dyad. It is evident that training conversational partners increases communicative accessibility for PWAs and is an effective treatment technique. However, there are very few studies that evaluate the effectiveness of conversation-based therapy for a PWA independent of a communication partner. Most studies that are published train the PWA in a group setting. Only two studies found have investigated how conversation

therapy can be used to increase communicative effectiveness of a PWA in an individual therapy session. There is a need for additional research in this area as many PWAs do not have consistent communication partners, decreasing the feasibility and effectiveness of partner training programs. Furthermore, most aphasia therapy is conducted in one-on-one therapy sessions with only the PWA and the clinician present. Therefore, individual conversation therapy may be the most effective method of improving conversation (Simmons-Mackie, Savage, & Worrall, 2014). The present study was conducted with the following objectives:

1. To examine the effectiveness of one-on-one conversational training with the PWA in improving language, cognitive-linguistic skills, communicative effectiveness, functional communication, perceived quality of life, and his spousal relationship.
2. To determine if one-on-one conversation training with the PWA results in more significant improvements compared to conversation partner training with the PWA's spouse.

Chapter 2: Methodology

The purpose of this study was to examine the effect of conversation training with a PWA independent of partner training on the PWA's language, communicative effectiveness, cognitive-linguistic skills, perceived quality of life, and relationship with his spouse, as compared to the partner training method.

Participants

A PWA and his spouse participated in this study.

Person with aphasia. The PWA was a 69-year-old monolingual English-speaking male stroke survivor with expressive and receptive aphasia. He was retired but previously worked as a marble installer. He graduated high school and attended a technical college. The PWA enjoyed dining at restaurants and watching and reading the news. Demographic information for the participant is detailed in Table 2.1. The participant had a moderate to profound hearing loss in his right ear for all frequencies and a moderate to severe hearing loss in the left ear at 2000 Hz, 4000 Hz, and 8000 Hz. He did not wear hearing aids at the time of the study. The participant attended group and individual therapies at a university speech-language and hearing clinic prior to this study. Approval by the Institutional Review Board (IRB) and informed consent by the participant were obtained before starting the study (see Appendix A for IRB approval and Appendix B for informed consent forms).

Table 2.1

Demographic Characteristics of the Participant

Age (years)	Sex	Etiology	Post-Onset (years)
69	Male	Left cerebrovascular accident (CVA)	14.5
		Subarachnoid hemorrhage secondary to traumatic brain injury (TBI)	4

Communication partner. The communication partner was the PWA's spouse. She was monolingual, and English was her primary language. She worked full-time outside of the home for an insurance company. She had received no previous partner training and expressed interest in learning strategies to better communicate with the PWA. Informed consent was obtained before starting the study (see Appendix C).

Design of the Study

Characteristics of aphasia present differently among PWAs (Robey & Schultz, 1998), making it difficult to conduct group studies in a limited time. A single-case study design allows the researcher to examine a participant in detail and to adapt the treatment during the experiment to best fit the participant's needs, making single-case designs ideal for clinical application (Byiers, Reichle, & Symons, 2012; Fukkink, 1996). Generalization of the results obtained from a single-case study may not be possible to every PWA in the general population. However, replication of single-case studies with additional participants can increase external validity by lending themselves for further examination under the lens of meta-analysis (Byiers, Reichle, & Symons, 2012). Therefore, a single-case study with a multiple-baseline across-behavior and A_1-B-A_2-C-A_3 design condition was implemented.

A_1 Condition. All standardized and criterion-referenced assessments detailed below were administered as a baseline measure prior to beginning intervention. Assessments were administered over three, one-hour long sessions.

B Condition/Treatment block 1. Treatment block 1 consisted of 10 weeks (19 hours) of independent conversation training with the PWA that targeted conversational skills training and conversational repair strategies to promote verbal discourse. Treatment sessions were approximately one hour long and occurred two times each week.

A_2 Condition. Intervention from treatment block 1 was withdrawn during a three-week washout period. All standardized and criterion-referenced assessments were re-administered immediately following treatment block 1 over three, one-hour long sessions.

C Condition/Treatment block 2. Treatment block 2 consisted of 11 weeks (16 hours) of partner training with the PWA's spouse using a modified version of the *Supporting Partners of People with Aphasia in Relationships and Conversation* (SPPARC) resource (Lock, Wilkinson, & Bryan, 2001). Treatment sessions were approximately 90-minutes long and occurred once each week.

A_3 Condition. Intervention from treatment block 2 was withdrawn. All standardized and criterion-referenced assessments were re-administered following treatment block 2 over two, 60-90-minute sessions.

Follow-Up. Standardized and criterion-referenced assessments that had shown significant changes in scores throughout the study were re-administered four months following the completion of treatment block 2 to assess maintenance of gains. Assessments were administered over two, one-hour long sessions.

Assessments

A variety of measures including standardized and criterion-referenced assessments and rating scales were used to assess language, cognitive-linguistic skills, functional communication abilities, quality of life, support and strain in the spousal relationship, and communicative effectiveness. Assessments are outlined in detail below.

Western Aphasia Battery-Revised (WAB-R). The WAB-R (Kertesz, 2007) was administered to assess the PWA's language skills. The WAB-R is a standardized modality-based measure used to determine the presence, type, and severity of aphasia. Subtests include spontaneous speech (e.g. describing a picture), auditory verbal comprehension (e.g. answering yes/no questions, pointing to objects), repetition (e.g. repeating sentences of increasing lengths), and naming and word finding (e.g. naming objects and other word retrieval tasks). Scores on each of the subtests are used to determine a composite aphasia quotient that corresponds with a severity rating. The WAB-R has high internal consistency, test-retest reliability, and inter- and intra-rater reliability. The assessment satisfies face- and content-validity criteria. It also has good construct validity when compared to the Neurosensory Center Comprehensive Examination for Aphasia (NCCEA) (Shewan & Kertesz, 1980).

Cognitive Linguistic Quick Test (CLQT). The CLQT (Helm-Estabrooks, 2001) was administered to assess the participant's cognitive-linguistic skills. The CLQT is a standardized measure that assesses the cognitive domains of attention, memory, language, executive functions, and visuospatial skills. Assessment tasks include personal facts, symbol cancellation, confrontation naming, clock drawing, story retelling, symbol trails, generative naming, design memory, mazes, and design generation. Scores on each of these tasks are compiled to generate composite scores and severity ratings for each of the cognitive domains. The CLQT shows high

inter-rater reliability with coefficients ranging from 0.61 to 0.90 for the cognitive domains. Inter-rater reliability for the memory domain is low at 0.61. Information about validity is limited. Additionally, a limited sample was used for standardization of the assessment (Celluci, 2014). The CLQT is frequently used as a criterion-referenced measure both clinically and in research studies.

Communication Activities of Daily Living-Second Edition (CADL-2). The CADL-2 (Holland, Frattali, & Fromm, 1980) was administered to assess the participant's functional communication abilities. It assesses reading, writing, using numbers, social interaction, divergent communication, contextual communication, nonverbal communication, sequential relationships, and humor/metaphors using real-life scenarios such as going to the doctor's office or going grocery shopping. The CADL-2 shows high inter-item, test-retest, and inter-rater reliability. It also has a high degree of criterion-related and construct validity (Person, 2014).

American Speech-Language-Hearing Association Functional Assessment of Communication Skills for Adults (ASHA FACS). The ASHA FACS (Frattali, Holland, Thompson, Wohl, & Ferketic, 1995) was completed by the PWA's spouse to assess the participant's functional communication abilities. The ASHA FACS is a 43-item rating scale that measures functional communication across four domains: social communication; communication of basic needs; reading, writing, and number concepts; and daily planning. It also addresses various activities of daily living including understanding television, responding in an emergency, and using a calendar. The ASHA FACS shows high intra- and inter-rater reliability. It has also been reported to have adequate content and construct validity (Frattali, Holland, Thompson, Wohl, & Ferketic, 1995).

American Speech-Language-Hearing Association Quality of Communication Life Scale (ASHA QCL). The ASHA QCL (Paul, Frattali, Holland, Thompson, Caperton, & Slater, 2004) was administered to assess the participant's perceived quality of life. The ASHA QCL is a rating scale that assesses the impact a communication disorder has on an individual's relationships; communication; interactions; participation in social, leisure, work, and education activities; and overall quality of life. It is reported that the ASHA QCL is a valid measure of the quality of communication life for adults with communication disorders (Paul et al., 2004).

Social Support and Strain Scale. The Social Support and Strain Scale (see Appendix D) was adapted from a study by Walen and Lachman (2000) and was completed independently by both the PWA and the PWA's spouse regarding perceived support and strain in their spousal relationship. It contained four items that measured supportive network exchanges and four items that measured strained network exchanges. Each item was answered on a 4-point Likert scale.

Procedural and Narrative Discourse Samples. Procedural discourse samples were collected by having the PWA explain how to make a peanut butter and jelly sandwich. Narrative discourse samples were collected by having the PWA retell the story of the Three Little Pigs after looking at a picture book of the story. The Correct Information Unit (CIU) analysis was completed for all samples based on the procedure outlined by Nicholas and Brookshire (1993). According to Nicholas and Brookshire (1993), the CIU analysis is a rule-based and standardized scoring system to measure the informativeness and efficiency of speech. The CIU analysis was used to quantify the amount of information conveyed by the PWA in connected speech. CIUs were calculated by transcribing the discourse samples. Words that were intelligible in context, even if they were not relevant or informative, were included in the total word count. Only words that were accurate, relevant, and informative about the stimulus were counted as CIUs. Nicholas

and Brookshire (1993) detail a variety of measures including percent of words that were CIUs (% CIUs), words per minute (WPM), and CIUs per minute (CIUs/min). % CIUs refers to the total number of relevant words divided by the total number of words in all utterances. WPM is the total number of words produced in one minute, and CIUs/min is the number of CIUs produced in one minute. These three measures are more stable from session to session than count measures such as number of words and number of CIUs with % CIUs measure showing the greatest stability (Nicholas & Brookshire, 1993). Therefore, % CIUs was used in the present study. Two samples of each discourse sample were collected and the mean % CIUs from the two was calculated. Intra- and inter-rater reliability is high for the CIU analysis procedure (Nicholas & Brookshire, 1993).

Treatment

Treatment Block 1. During the first block of treatment, independent conversation training with the PWA was conducted by the student researcher during individual therapy sessions. The PWA received 19 hours of independent conversation training over 10 weeks. Treatment sessions were approximately one hour long and occurred two times each week. In each session, the first 40 minutes focused on direct conversation training with the PWA targeting a variety of conversation skills and conversational repair strategies to promote verbal discourse. Conversation skills included topic initiation; asking questions to enhance appropriate turn taking; providing sufficient details; and changing topics by stating the topic, using a topic sentence, or using a transition word or phrase. Macrostructure conversation skills were targeted because there is evidence that a PWA's microlinguistic impairments affect the macrostructure of discourse (Boyle, 2011). Conversational repair strategies targeted included asking for clarification, requesting repetition, rephrasing, describing a word when word-finding difficulties occurred,

drawing, and using gestures. Generalization of these learned conversation strategies to everyday life was built into treatment from the beginning by having the PWA interact with unfamiliar communication partners for the last 10 minutes of each session. The PWA practiced the targeted skills in conversation. These interactions were frequently video-recorded, and the researcher left the room and observed the interaction behind a one-way mirror. Communication partners were encouraged to allow silence to prompt the PWA to initiate topics and ask questions. The last 10 minutes of the sessions were spent targeting self-awareness through video self-monitoring and rating scales.

A modified version of the semantic feature analysis (SFA) procedure was utilized at the discourse level when the PWA had word retrieval difficulties. Many variations of SFA have been employed in discourse treatment. For example, Rider, Wright, Marshall, and Page (2008) selected contextually-relevant target words from well-known sitcoms and procedural discourse stimuli and trained these words using SFA. Generalization to discourse was then assessed from language samples. Other studies selected target words based on word-retrieval difficulties that occurred during discourse related to a stimulus item. The SFA procedures varied with some studies immediately suspending discourse to complete SFA for the problematic word and others completing SFA when the discourse was finished (Boyle, 2004; Falconer & Antonucci, 2012; Peach & Reuter, 2010). Improvements were seen in effectiveness and efficiency of verbal production following treatment (Boyle, 2011).

In the present study, a variety of stimuli were used to elicit verbal discourse. These included photographs, paintings, news articles, and the participant's personal stories. The PWA completed a discourse-level web map (similar to a SFA map, but expands on the topic using "wh" questions; see Appendix E) to structure conversation related to the topic of the stimulus

item. The PWA was asked to identify 2-3 details about the stimulus that fit into each of the six categories (who, what, when, where, why, how) outlined on the discourse-level web map. If details from each of these categories were not explicit, the PWA generated possible details about the stimulus item based on contextual cues. For example, one of the items used in this study was a painting depicting a young girl sitting outside of the principal's office. The PWA generated possible reasons for why the girl was in trouble and listed these in the "why" category. The researcher facilitated and provided cues as needed. When word-retrieval difficulties occurred, the discourse was suspended and a noun or verb word-level SFA map (see Appendix F and G) was completed by identifying semantic features of the word (Boyle & Coelho, 1995; Peach & Reuter, 2010). This exercise strengthens the PWA's semantic network and facilitates word retrieval. Once the PWA had successfully completed details for each box of the discourse map, he was used to narrate the whole topic. He could use the discourse map to complete the narration. The PWA was also asked to use this map and discuss the topic with the unfamiliar communication partner at the end of the treatment session.

To facilitate the PWA's verbal production, the Promoting Aphasics' Communicative Effectiveness (PACE) method with constraints was also used in treatment block 1. A barrier (poster board) was placed between the PWA and the communication partner to encourage the PWA to use descriptive language to describe and expand on the topic of the stimulus item to his communication partner.

Conversational practice with unfamiliar communication partners was used throughout treatment to reduce anxiety and increase confidence. Practice occurred both face-to-face, with and without barriers, and on the telephone as the PWA identified these as challenging speaking

situations. The PWA's conversations/discourses with the student researcher and the unfamiliar communication partners were video-taped for coaching self-awareness of discourse strategy use.

Video self-monitoring was used to train macrostructure conversation skills and increase awareness of use of repair strategies. Macrostructure conversation skills such as initiating a topic, maintaining a topic, signaling a change in topic, and turn-taking were discussed. Effective repair strategies such as asking for clarification, rephrasing, describing a word, and using multiple modalities were also taught and practiced. Conversations between the PWA and communication partners were video-recorded and reviewed. Immediately following the conversation, the PWA and the researcher watched the recordings and separately rated the interaction using the Communication Interaction Rating Scale for Aphasia Group (see Appendix H) (Garrett, Staltari, Moir, & Sittner, 2006). Ratings were then compared, and use of macrostructure skills and repair strategies in the recorded interaction were discussed.

Treatment Block 2. During the second block of treatment, the PWA's spouse received partner training using a modified version of the *Supporting Partners of People with Aphasia in Relationships and Conversation* (SPPARC) resource (Lock, Wilkinson, & Bryan, 2001). The PWA's spouse received 16 hours of partner training over 11 weeks. Treatment sessions were approximately 1.5-hours long and occurred once each week. The researcher met individually with the PWA's spouse, and the PWA was not present during the sessions. The PWA was also not receiving any treatment during treatment block 2.

In each session, the first 30 minutes were spent discussing challenging communication situations that occurred that week and reviewing the previous week's home assignment. Home assignments were provided each week to promote generalization of strategy use. The assignments used were from SPPARC. Assignments focused on the specific strategy that was

targeted during the session and asked the partner to use strategies in the home environment and report the outcome. For example, repair strategies were targeted one session. For the home assignment, the PWA's spouse was asked to write down communication difficulties that occurred, the strategies she or the PWA used, whether the strategies solved the problem, how long it took to solve the problem, and how the PWA's spouse felt. Reducing long repairs was targeted another week. The home assignment asked the PWA's spouse to state alternatives to solving problems and good habits to prevent problems that she was going to try that week. Throughout the week, she identified when problems arose. She wrote down the problem or what good habit she used to prevent a problem, what she did when the problem happened, whether the action stopped the conversation or helped it flow, how she and the PWA felt, and any other strategies she could have tried.

The next 30 minutes involved direct training of partner communication strategies. Select strategies were chosen from SPPARC based on the partner's needs and fell under three primary categories: trouble and repair; turns and sequences; and topic and overall conversation (Lock, Wilkinson, & Bryan, 2001). The researcher taught 1-2 strategies each session using the photocopiable handouts from SPPARC as a reference. Strategies targeted included decreasing speaking rate, limiting the number of interruptions, arranging the environment to reduce distractions, limiting corrections when the PWA's overall message was understood, writing down information to ensure comprehension, and summarizing and paraphrasing information. The partner was asked to identify common communication breakdowns that occur between her and the PWA and strategies were provided based on the breakdowns identified. For example, the partner identified that the PWA may not be able to say a word and does not use a gesture or

writing. A strategy the partner could use would be to suggest that the PWA shows what he means by using a gesture, pointing, drawing, or writing.

The partner brought in video recordings of conversations between her and the PWA at the beginning and end of treatment block 2. The last 30 minutes of sessions were spent reviewing clips of these recordings and identifying when the target strategy was used in the video or could have been used.

Chapter 3: Results

The following chapter outlines the results and discussion from both the treatment blocks. The PWA received 19 hours of conversation training during treatment block 1. During treatment block 2, this intervention was withdrawn and the PWA's spouse received 16 hours of partner training. The break following the end of spring semester provided a three-week wash-out period between the two treatment blocks. The following null hypothesis was considered: both a conversation training program and a partner training program will yield similar results when used independently in therapy with a PWA.

Outcomes from both treatment blocks were assessed using a variety of standardized and criterion-referenced assessments to assess the PWA's language, cognitive-linguistic skills, functional communication, quality of life, support and strain in the spousal relationship, and communicative effectiveness. Assessments included the WAB-R, CLQT, CADL-2, ASHA FACS, ASHA QCL, Social Support and Strain Scale, and discourse analysis measures. Results were analyzed using non-parametric statistics to determine the effects of treatment blocks 1 and 2 and maintenance of gains. The results were then compared between treatment blocks and to pre-treatment outcomes. Overall, the PWA's performance on all assessments was significantly better following treatment block 1 (independent conversation training with the PWA) than following treatment block 2 (partner training) leading to the rejection of the null hypothesis. A detailed summary of outcomes on standardized assessments, criterion-referenced assessments, and discourse measures follows.

Results: Pre-Treatment Baselines

WAB-R. The WAB-R was administered to determine the PWA's type and severity of aphasia and to evaluate his language skills before the start of treatment. Results during this pre-

treatment baseline testing indicated that he had conduction aphasia. The PWA received an Aphasia Quotient of 67.7 which corresponds to a moderate degree of aphasia. On the spontaneous speech subtest, the PWA received an information content score of 8 and a fluency score of 6 on a 10-point scale. An information content score of 8 describes the PWA's spontaneous speech as correctly answering 5 conversational questions and providing an incomplete description of a picture. A fluency score of 6 describes the PWA's spontaneous speech as having more propositional sentences with normal syntax, possible paraphasias, and significant word-finding difficulties and hesitations (Kertesz, 2007). The PWA's auditory verbal comprehension, repetition, and word finding were also impaired. The PWA received the lowest scores on the repetition subtest. See table 3.1 for complete assessment results.

CLQT. The CLQT was administered to evaluate the PWA's cognitive-linguistic skills. Results during pre-treatment baseline testing indicated that his performance in the cognitive areas of attention and visuospatial skills were within normal limits. He showed mild deficits in executive functions. The PWA received a rating of severe in both the language and memory domains likely due to his expressive aphasia. Many of the tasks that assess memory are linguistic tasks, so severity of memory deficits may have been inflated. The PWA received a rating of moderate on the clock drawing task which is a task often used to screen overall cognitive function (Freedman, Leach, Kaplan, Winocur, Shulman, & Delis, 1994). See table 3.2 for complete assessment results.

CADL-2. The CADL-2 was administered to evaluate the PWA's functional communication skills in simulated real-life situations. The PWA received a stanine score of 5 which is considered average. Stanine scores have a mean of 5 with a standard deviation of 2. See table 3.3 for complete assessment results.

ASHA FACS. The ASHA FACS was administered to evaluate the PWA's functional communication skills in his everyday environments. The PWA's wife completed the rating scale. Results indicated that he was independent in communicating his basic needs. He completed most tasks with minimal assistance in the domain of social communication. He completed tasks with moderate assistance in the areas of reading, writing, and numbers and daily planning. See table 3.4 for complete assessment results.

ASHA QCL. The ASHA QCL was administered to evaluate the PWA's perceived quality of life. Based on the PWA's self-ratings, the overall mean rating pre-treatment was 3 on a 5-point scale. See table 3.5 for complete assessment results.

Social Support and Strain Scale. The Social Support and Strain Scale was completed by both the PWA and the PWA's spouse to assess perceived support and strain in their spousal relationship. Items were rated on a 4-point Likert scale. For items assessing support, a score of 1 indicated a lot of support and a score of 4 indicated no support. Pre-treatment baseline outcomes indicated that the PWA felt "a lot" of support in his spousal relationship as shown by a mean rating of 1 on a 4-point scale. The PWA's spouse also felt "a lot" of support in her spousal relationship as shown by a mean rating of 1.25 on a 4-point scale. For items assessing strain, a score of 1 indicated a lot of strain and a score of 4 indicated no strain. The PWA felt strain "sometimes" in his spousal relationship as shown by a mean rating of 2.25 on a 4-point scale. The PWA's spouse reported slightly lower levels of strain with a mean rating of 2.75. See table 3.6 for complete assessment results.

Discourse Analysis. Procedural discourse and narrative retell samples were obtained from the PWA. Percentage of CIUs was calculated from each sample and a mean % CIUs was determined from the two samples. For procedural discourse, the PWA produced 19.6% CIUs in

sample 1 and 17.98% CIUs in sample 2 for a mean of 18.79% CIUs. For narrative retell (story task), the PWA produced 83.3% CIUs in sample 1 and 68.3% CIUs in sample 2 for a mean of 75.8% CIUs. The PWA produced a higher percentage of CIUs in the narrative discourse than in the procedural discourse. See table 3.7 for complete assessment results.

Results: Block 1 Outcomes

WAB-R. In treatment block 1, the PWA received direct conversation training. Following intervention, the PWA showed improvements in auditory verbal comprehension, naming and word finding, and repetition on the WAB-R. There was a slight decline in scores on the spontaneous speech subtest resulting from a decrease in information content during a spontaneous speech sample. Overall, the PWA's AQ improved by 5.6 points when compared to pre-treatment baseline outcomes. A change of 5 or more AQ points is considered to be clinically significant (Katz & Wertz, 1997). An AQ of 73.3 corresponds to a diagnosis of moderate conduction aphasia. See table 3.1 for complete assessment results.

CLQT. The PWA's scores on all cognitive domain areas of the CLQT improved or remained stable following individual conversation training. The results were compared to the baseline measures using a two-proportions test to determine the significance of change, if any. Following treatment block 1, the PWA's performance in the areas of attention and visuospatial skills remained within normal limits and his performance in executive functions remained stable. He showed improvements in the areas of memory, language, and on the clock drawing task with statistically significant improvements in the memory domain ($p=0.00$). See table 3.2 for complete assessment results.

CADL-2. The PWA received a stanine score of 5 following treatment block 1, indicating no change in his functional communication skills measured on the test. See table 3.3 for complete assessment results.

ASHA FACS. Results were compared to baseline measures using a paired samples t-test to determine the significance of change, if any. Mean scores in the domains of social communication; reading, writing, and numbers; and daily planning improved following individual conversation training with the PWA. The mean score in the domain of communication of basic needs was consistent with pre-treatment baseline measures. There was a statistically significant improvement ($p=0.007$) in the Overall Communication Independence Mean Score compared to baseline, indicating an improvement in functional communication abilities in everyday environments. See table 3.4 for complete assessment results.

ASHA QCL. The results were compared to baseline outcomes using a paired samples t-test to determine significance of change, if any. The PWA's overall mean rating showed significant improvements ($p=0.018$) in perceived quality of life. See table 3.5 for complete assessment results.

Social Support and Strain Scale. Outcomes following treatment block 1 indicated that the PWA continued to feel "a lot" of support in his spousal relationship as shown by a mean rating of 1. The PWA's spouse showed a slight improvement in overall support. Ratings also indicated that the PWA felt slightly less strain in the relationship, whereas his spouse rated overall strain slightly higher than baseline measures. See table 3.6 for complete assessment results.

Discourse Analysis. The results were compared to baseline measures using a paired samples t-test and Cohen's d effect size to determine the significance of change, if any.

Following conversation training with the PWA, there was a significant improvement (p=0.034) in % CIUs in procedural discourse. The PWA produced 72.5% CIUs in sample 1 and 65.6% CIUs in sample 2 for a mean of 69.05% CIUs. For the narrative retell, there was a slight increase in % CIUs compared to baseline measures. The PWA produced 91.2% CIUs in sample 1 and 68.29% CIUs in sample 2 for a mean of 79.75% CIUs. Although this improvement was not significant, the effect size was greater than 9, suggesting a large magnitude of change between the means. See table 3.6 for complete assessment results.

Results: Block 2 Outcomes

WAB-R. In treatment block 2, independent conversation training with the PWA was withdrawn, and the PWA's spouse received partner training. Following treatment block 2, the PWA's score on the spontaneous speech subtest remained consistent with results following treatment block 1. He showed a slight improvement in repetition. His performance on the auditory verbal comprehension and naming and word findings tasks decreased compared to post-block 1 outcomes. However, these scores did not drop below baseline outcomes. The PWA's AQ dropped 3.5 points to 69.8. The score was still consistent with moderate conduction aphasia, but his AQ did not fall below baseline. See table 3.2 for complete assessment results.

CLQT. The results were compared to post-block 1 outcomes and baseline outcomes using a two-proportions test to determine significance of change. The PWA's scores on most cognitive domain areas of the CLQT declined following treatment block 2. There was a statistically significant decline in scores in attention (p=0.002), memory (p=0.005), and visuospatial skills (p=0.014). Performance in executive functions and language also decreased. Scores on the clock drawing task remained stable compared to post-block 1 outcomes. See table 3.2 for complete assessment results.

CADL-2. The PWA received a stanine score of 5 following treatment block 2, indicating no change in his functional communication skills. See table 3.3 for complete assessment results.

ASHA FACS. Results were compared to post-block 1 outcomes and baseline measures using a paired samples t-test to determine significance of change. Mean scores in the domain of social communication improved slightly following partner training with the PWA's spouse. Scores in the domains of communication of basic needs; reading, writing, and numbers; and daily planning all decreased. The Overall Communication Independence Mean Score also decreased. These declines were not significant and did not fall below baseline. See table 3.4 for complete assessment results.

ASHA QCL. Results were compared to post-block 1 outcomes and baseline measures using a paired samples t-test to determine significance of change. The PWA's overall mean rating showed a significant decline ($p=0.018$) in perceived quality of life. However, the overall mean rating did not fall below pre-treatment baseline outcomes. See table 3.5 for complete assessment results.

Social Support and Strain Scale. Outcomes following treatment block 2 indicated that the PWA continued to feel "a lot" of support in his spousal relationship as shown by a mean rating of 1. The PWA's spouse showed a decline in overall support. Ratings also indicated that both the PWA's and the PWA's spouse's perceived level of strain in the relationship increased slightly. See table 3.6 for complete assessment results.

Discourse Analysis. The results were compared to post-block 1 outcomes and baseline measures using a paired samples t-test and Cohen's d effect size to determine significance of change. Following partner training with the PWA's spouse, there was an improvement in % CIUs in procedural discourse. The PWA produced 68.5% CIUs in sample 1 and 83.3% CIUs in

sample 2 for a mean of 75.9% CIUs. Although the improvement was not statistically significant, the effect size was greater than 9, suggesting a large magnitude of change. For the narrative discourse, there was a decrease in % CIUs compared to post-block 1 outcomes. The PWA produced 53.8% CIUs in sample 1 and 76% CIUs in sample 2 for a mean of 64.9% CIUs. Although the difference between the means for the narrative discourse was not statistically significant, the effect size was greater than 9, suggesting a large practical significance in decline. See table 3.7 for complete assessment results.

Results: Follow-Up Outcomes

WAB-R. The WAB-R was re-administered four months following the completion of treatment block 2 to assess maintenance of gains. The PWA was not receiving any therapy during the four months. The PWA's scores on all subtests decreased with the largest declines seen in auditory verbal comprehension and repetition. The PWA's AQ decreased 13.6 points compared to post-block 2 outcomes to 56.2 which corresponds to moderate conduction aphasia. A change of 5 or more AQ points is considered clinically significant (Katz & Wertz, 1997). This score was significantly lower than when he started treatment initially in block 1. See table 3.1 for complete assessment results.

CLQT. The language and memory domains as well as the clock drawing task were re-assessed during follow-up testing. These were re-administered because declines were seen in these domains following treatment block 2, but scores had not dropped below baseline outcomes. The results were compared to post-block 2 outcomes using a two-proportions test to determine significance of change. There was a statistically significant decline in scores in the memory domain ($p=0.00$) compared to post-block 2 outcomes. There was a slight decrease in performance in the language domain, but it was not significant. Performance on the clock

drawing task remained consistent with results immediately following treatment block 2. See table 3.2 for complete assessment results.

CADL-2. The CADL-2 was not re-administered during follow-up testing as scores had remained stable throughout the study.

ASHA FACS. The results were compared to post-block 2 outcomes using a paired samples t-test to determine significance of change. Mean scores in the domains of social communication; communication of basic needs; and daily planning remained consistent with post-block 2 outcomes. The mean score in the reading, writing, and numbers domain increased slightly. There was a slight increase in the Overall Communication Independence Mean Score, but the improvement was not significant. See table 3.4 for complete assessment results.

ASHA QCL. The results were compared to post-block 2 outcomes using a paired samples t-test to determine significance of change. There was a decline in the PWA's overall mean rating of perceived quality of life during the follow-up assessment. However, this decrease was not significant and the mean did not fall below baseline. See table 3.5 for complete assessment results.

Social Support and Strain Scale. Outcomes from the follow-up assessment indicated that the PWA felt less support in his spousal relationship than immediately following treatment block 2. The PWA's spouse felt more support. Ratings showed that the PWA's perceived level of strain in the relationship increased slightly, whereas the PWA's spouse's perceived level of strain decreased. See table 3.6 for complete assessment results.

Discourse Analysis. The results were compared to post-block 2 outcomes using a paired samples t-test and Cohen's d effect size to determine significance of change. During the follow-up assessment, % CIUs for the procedural discourse sample remained consistent with post-block

2 outcomes. The PWA produced 71.4% CIUs in sample 1 and 80% CIUs in sample 2 for a mean of 75.7% CIUs. The PWA refused to complete the narrative retell sample, so follow-up data is not available. See table 3.7 for complete assessment results.

Table 3.1

WAB-R Results

Subtests	**Block 1 – PWA Conversation Training** Pre/Post Block Scores	**Block 2 – Partner Training** Pre/Post Block Scores	**Follow-Up Testing (4 months following block 2)** Pre/Post Block Scores
Information Content (/10)	8/7	7/7	7/5
Fluency (/10)	6/6	6/6	6/5
Spontaneous Speech (/20)	**14/13**	**13/13**	**13/10**
Yes/No Questions (/60)	54/57	57/54	54/48
Auditory Word Recognition (/60)	51/58	58/56	56/54
Sequential Commands (/80)	56/80	80/68	68/48
Auditory Verbal Comprehension (/200)	**161/197**	**197/178**	**178/150**
Repetition (/100)	**51/60**	**60/62**	**62/43**
Object Naming (/60)	46/55	55/44	44/46
Word Fluency (/20)	7/8	8/7	7/4
Sentence Completion (/10)	7/8	8/8	8/6
Responsive Speech (/10)	7/7	7/9	9/7
Naming and Word Finding (/100)	**67/78**	**78/68**	**68/63**
Aphasia Quotient	**67.7/73.3♦**	**73.3/69.8**	**69.8/56.2***

♦Indicates improvement of +5.6 AQ points following treatment block 1. *Indicates decrease of -13.6 AQ points four months after treatment block 2. A change of 5 or more points is considered to be clinically significant (Katz & Wertz, 1997).

Table 3.2

CLQT Results

Cognitive Domain	**Block 1 – PWA Conversation Training** Pre/Post Block Scores	**Block 2 – Partner Training** Pre/Post Block Scores	**Pre/Post Therapy (overall)**	**Follow-Up Testing (4 months following block 2)** Pre/Post Block Scores
Attention (/215)	187/185	**185/159* (p=0.002)**	**187/159* (p=0.001)**	N/A
Memory (/185)	**104/147♦ (p=0.000)**	**147/123* (p=0.005)**	**104/123♦ (p=0.041)**	**123/85* (p=0.000)**
Executive Functions (/40)	22/23	23/16	22/16	N/A
Language (/37)	20/25	25/21	20/21	21/19.5
Visuospatial Skills (/105)	88/91	**91/77* (p=0.014)**	88/77	N/A
Clock Drawing (/13)	8/10	10/11	8/11	11/11

Data was analyzed using a two-proportions test.
. ♦Indicates a statistically significant improvement in scores. *Indicates a statistically significant decrease in scores

Table 3.3

CADL-2 Results

	Block 1 – PWA Conversation Training Pre/Post Block Scores	**Block 2 – Partner Training** Pre/Post Block Scores	**Pre/Post Therapy (overall)**
Stanine Score	5/5	5/5	5/5

Table 3.4

ASHA FACS Results

Domain (Scale of 1-7)	**Block 1 – PWA Conversation Training** Pre/Post Block Scores	**Block 2 – Partner Training** Pre/Post Block Scores	**Pre/Post Therapy (overall)**	**Follow-Up Testing (4 months following block 2)** Pre/Post Block Scores
Social Communication	5.95/6.29	6.29/6.38	5.95/6.38	6.38/6.38
Communication of Basic Needs	7/7	7/6.86	7/6.86	6.86/6.86
Reading, Writing, Numbers	4.5/5.3	5.3/4.9	4.5/4.9	4.9/5
Daily Planning	4.4/6.8	6.8/5.4	4.4/5.4	5.4/5.4
Overall Communication Independence Mean Score	**5.46/6.35♦ (p=0.007)**	**6.36/5.88**	**5.46/5.88**	**5.88/5.91**

Data analyzed using a paired samples t-test. ♦Indicates a statistically significant improvement in scores.

Table 3.5

ASHA QCL Results

	Block 1 – PWA Conversation Training Pre/Post Block Scores	**Block 2 – Partner Training** Pre/Post Block Scores	**Pre/Post Therapy (overall)**	**Follow-Up Testing (4 months following block 2)** Pre/Post Block Scores
Mean Score Overall	**3/4.25♦ (p=0.003)**	**4.25/3.5* (p=0.018)**	3/3.5	3.5/3.12

Data analyzed using a paired samples t-test. ♦Indicates a statistically significant improvement in scores. *Indicates a statistically significant decrease in scores

Table 3.6

*Social Support and Strain Scale Results***

	Block 1 – PWA Conversation Training Pre/Post Block Scores	**Block 2 – Partner Training** Pre/Post Block Scores	**Pre/Post Therapy (overall)**	**Follow-Up Testing (4 months following block 2)** Pre/Post Block Scores
PWA Mean Support	1/1	1/1	1/1	1/2.25
PWA Mean Strain	2.25/2.75	2.75/2.5	2.25/2.5	2.5/2.5
PWA's Spouse Mean Support	1.25/1	1/1.5	1.25/1.5	1.5/1.25
PWA's Spouse Mean Strain	2.75/2.25	2.25/2	2.75/2	2/2.75

**Items were scored on a scale of 1-4. For support items, a lower number indicates a higher level of support. For strain items, a lower number indicates a higher level of strain.

Table 3.7

CIU Analysis Results

	Block 1 – PWA Conversation Training Pre/Post Block Scores	**Block 2 – Partner Training** Pre/Post Block Scores	**Pre/Post Therapy (overall)**	**Follow-Up Testing (4 months following block 2)** Pre/Post Block Scores
% CIUs for Procedural Discourse	**18.79%/69.05%♦ (p=0.034)**	69.05%/75.09% **(Cohen's d = > 9)**	18.79%/75.09%	75.09%/75.70%
% CIUs for Narrative Discourse	75.80%/79.75% **(Cohen's d = > 9)**	79.75%/64.93% **(Cohen's d = > 9)**	75.80%/64.93% **(Cohen's d = > 9)**	N/A

Data analyzed using a paired samples t-test. ♦Indicates a statistically significant improvement in scores. For Cohen's d, green font indicates improvements and red font indicates declines.

Reliability

Reliability was calculated to ensure scoring was accurate for the discourse analysis measures. Intra-rater reliability for the procedural and narrative discourse samples was obtained by having the first rater transcribe the discourse samples and calculate % CIUs a second time for each sample at least 3 months after the first analysis was completed without looking at the previous outcomes. See table 3.8 for intra-rater reliability calculations. Inter-rater reliability was obtained by having two other scorers transcribe the discourse samples and calculate % CIUs. These calculations were then compared to the results of the first rater. See table 3.9 for inter-rater reliability calculations. Consistency between ratings was calculated using a two-proportions test. All calculated p-values for both intra-rater and inter-rater reliability were greater than 0.05 which means that all ratings are consistent.

Table 3.8

Intra-Rater Reliability

	Baseline Ratings	**Post-Block 1 Ratings**	**Post-Block 2 Ratings**
Procedural Discourse	z = -0.15 p = 0.879	z = -0.94 p = 0.347	z = -0.14 p = 0.891
Narrative Discourse	z = 0.09 p = 0.926	z = 0.67 p = 0.503	z = 0.13 p = 0.895

Data analyzed using a two-proportions test. P-values greater than 0.05 indicate consistency between ratings.

Table 3.9

Inter-Rater Reliability

Baseline Ratings			
	Rater 1 – Rater 2	**Rater 2 – Rater 3**	**Rater 1 – Rater 3**
Procedural Discourse	z = -1.22 p = 0.223	z = 1.16 p = 0.246	z = -0.04 p = 0.967
Narrative Discourse	z = 1.15 p = 0.248	z = -0.65 p = 0.516	z = 0.50 p = 0.618
Post-Block 1 Ratings			
	Rater 1 – Rater 2	**Rater 2 – Rater 3**	**Rater 1 – Rater 3**
Procedural Discourse	z = -1.14 p = 0.254	z = 0.87 p = 0.384	z = -0.26 p = 0.796
Narrative Discourse	z = 0.80 p = 0.427	z = -1.86 p = 0.063	z = -1.05 p = 0.292
Post-Block 2 Ratings			
	Rater 1 – Rater 2	**Rater 2 – Rater 3**	**Rater 1 – Rater 3**
Procedural Discourse	z = -0.30 p = 0.768	z = 0.09 p = 0.930	z = 0.37 p = 0.713
Narrative Discourse	z = -1.56 p = 0.118	z = 1.80 p = 0.071	z = 0.09 p = 0.926

Data analyzed using a two-proportions test. P-values greater than 0.05 indicate consistency between raters.

In summary, the results of this study indicated the following:

1. The PWA's WAB-R scores significantly increased after treatment block 1 but decreased after treatment block 2. There was a significant decline in the AQ scores during the follow-up testing after 4 months.
2. The PWA's scores on the memory domain of the CLQT improved significantly after treatment block 1. Scores in the domains of attention, memory, and visuospatial skills decreased significantly after treatment block 2. There was a significant decline in the memory domain scores during follow-up testing.
3. The PWA's scores on the CADL-2 remained consistent throughout the study.
4. The Overall Communication Independence Mean Score on the ASHA FACS improved significantly following treatment block 1. The mean score decreased following treatment block 2 and increased during follow-up testing. However, these changes were not significant.
5. The PWA's mean scores on the ASHA QCL significantly increased following treatment block 1 but decreased after treatment block 2.
6. There were no significant changes in the PWA's and the PWA's spouse's ratings on the Social Support and Strain Scale throughout the study.
7. % CIUs for the procedural discourse significantly increased following treatment block 1. There was a large positive magnitude of change for % CIUs for the narrative discourse sample. Following treatment block 2, there was a large positive magnitude of change for % CIUs for the procedural discourse but a large negative magnitude of change for the narrative discourse.

Chapter 4: Discussion

The aim of this study was to evaluate the effectiveness of a conversation training program directed at a PWA independent of partner training. Specifically, the following null hypothesis was tested: both a conversation training program and a partner training program will yield similar results when used independently in therapy with a PWA.

Outcomes following conversation training were compared to results following partner training to determine if one treatment was more effective than the other. The PWA's language, cognitive-linguistic skills, functional communication, perceived quality of life, support and strain in the spousal relationship, and communicative effectiveness were evaluated. Results showed significant improvements in language, memory, functional communication skills, perceived quality of life, and communicative effectiveness for procedural discourse following independent conversation training with the PWA. When conversation training with the PWA was withdrawn and partner training was provided to the PWA's spouse, significant declines were seen in a variety of cognitive domain areas and in perceived quality of life for the PWA. This led to the rejection of the null hypothesis. Many of the gains were not maintained during follow-up testing.

The highlights of the outcomes were as follows:

1. The PWA's WAB-R scores significantly increased after treatment block 1 but decreased after treatment block 2. There was a significant decline in the AQ scores during the follow-up testing after 4 months.
2. The PWA's scores on the memory domain of the CLQT improved significantly after treatment block 1. Scores in the domains of attention, memory, and visuospatial skills decreased significantly after treatment block 2. There was a significant decline in the memory domain scores during follow-up testing.

3. The PWA's scores on the CADL-2 remained consistent throughout the study.
4. The Overall Communication Independence Mean Score on the ASHA FACS improved significantly following treatment block 1. The mean score decreased following treatment block 2 and increased during follow-up testing. However, these changes were not significant.
5. The PWA's mean scores on the ASHA QCL significantly increased following treatment block 1 but decreased after treatment block 2.
6. There were no significant changes in the PWA's and the PWA's spouse's ratings on the Social Support and Strain Scale throughout the study.
7. % CIUs for the procedural discourse significantly increased following treatment block 1. There was a large positive magnitude of change for % CIUs for the narrative discourse sample. Following treatment block 2, there was a large positive magnitude of change for % CIUs for the procedural discourse but a large negative magnitude of change for the narrative discourse.

These results will be discussed separately in each treatment block and will then be compared and contrasted.

Treatment Block 1

In treatment block 1, the PWA received direct conversation training independent of partner training. Following intervention, the PWA showed significant improvements in language, memory, functional communication skills as rated by his spouse, perceived quality of life, and communicative effectiveness for procedural discourse. This suggests that direct conversation training with a PWA is effective in improving a variety of skills as well as the PWA's quality of life. Gains in language, memory, and communicative effectiveness may be secondary to

language and cognitive stimulation that was inherent in the structured conversation training tasks used in the treatment. For example, when completing a discourse-level map about a news article, the PWA was required to hold important information from the article in his memory, thus training memory functions. He was also made aware of the various details pertaining to the topic through visuospatial schema by using a discourse web map. This may have facilitated not only self-awareness to the macrostructures and microstructures of the discourse content, but also visuospatial and memory functions. Thus, although cognitive skills were not directly targeted during treatment, many cognitive-linguistic skills could have been indirectly targeted in the treatment tasks. Qualitatively, the PWA reported that he was more willing to speak with unfamiliar communication partners and to speak on the telephone (a situation he previously avoided) following treatment. The PWA's spouse also reported that she noticed improved confidence in the PWA when speaking to familiar and unfamiliar communication partners. It is likely that these improvements resulted from the systematic conversation training with unfamiliar communication partners both face-to-face and on the telephone that was incorporated into treatment. Generalization of skills occurred to the PWA's home environment as shown in improvements in functional communication skills on the ASHA FACS as well as to untrained discourse tasks as shown in improvements in % CIUs for the procedural discourse task. Impairment-based therapies often do not target generalization throughout treatment and expect that skills will generalize to everyday communication. However, preliminary findings do not present conclusive evidence that this generalization occurs (Savage, Donovan, & Hoffman, 2014). Generalization in this study was intentionally addressed from the beginning of treatment. Therefore, the generalization of skills to environments outside of therapy is likely due to

targeting the carryover of skills throughout intervention and by including activities that mirrored real-life conversations, activities to increase self-awareness, and video self-monitoring.

Although studies evaluating the effects of direct conversation training with a PWA independent of partner training are limited, the present study outcomes are consistent with them. Basso (2010) found that the PWA in the study showed increased comprehension and vocabulary following conversation training. The PWA was also able to introduce a new conversational topic and convey simple thoughts in conversation which increased life participation. The PWA in the current study also showed increased comprehension and vocabulary as shown by marked improvements in scores on the auditory verbal comprehension and naming and word finding subtests on the WAB-R. Anecdotally, the PWA's spouse reported that the PWA was more motivated to initiate conversation with others. In another study, the PWA showed a large treatment effect for increased facilitative conversational interactions and for decreased non-facilitative conversational interactions following conversation training (Savage, Donovan, & Hoffman, 2014). Both studies suggest that direct conversation training with a PWA can improve language skills, communication skills, and quality of life. The current study results support this research. The PWA's scores on the ASHA FACS and the ASHA QCL improved significantly following independent conversation training suggesting improved functional communication skills and quality of life.

The present study also supports previous research findings that conversation training with a PWA independent of partner training can lead to improvements in language, communication, and quality of life. This study differed from other studies in that the effects of conversation training were more broadly evaluated. Improvements were seen in cognitive-linguistic skills and communicativeness effectiveness following conversation training with the PWA. These domains

have not been previously studied. It is possible that these broad improvements are due to the structured nature of the treatment. Furthermore, past research evaluated the effectiveness of independent conversation training with a PWA alone and did not compare the effects to another type of conversation training such as partner training. The current study compared the effectiveness of independent conversation training with partner training which is more commonly used in aphasia treatment.

In the present study, a variety of treatment techniques were incorporated in the conversation training program with the PWA including discourse-level SFA and self-monitoring. Previous studies have evaluated the effects of SFA as a treatment in discourse. Improvements were seen in the percentage of nouns produced and number of words produced (Antonucci, 2009; Peach & Reuter, 2010). PWAs were also found to increase their production of information content by increasing % CIUs, increasing number of CIUs, or increasing number of CIUs per minute in discourse samples following treatment (Antonucci, 2009; Boyle, 2004; Peach & Reuter, 2010).

Self-monitoring training with PWAs has also been shown to be effective. In a study by Whitney and Goldstein (1989), PWAs with mild aphasia self-monitored disfluencies (e.g. audible pauses, word or phrase break offs/revisions, or repetitions) in their speech by listening to audiotapes and pressing a counter whenever they heard the target behavior. Participants showed an immediate decrease in the frequency of disfluencies following initiation of self-monitoring, and self-monitoring was shown to generalize to different tasks. Very little research has been conducted evaluating the effects of self-monitoring training with PWAs. However, many studies have examined self-monitoring in individuals who stutter and have shown positive treatment effects. Positive changes in target behaviors during self-monitoring are likely due to clinician

instruction, direct self-monitoring training with the client, physical reminders to self-monitor productions (e.g. holding a counter), independent self-monitoring, self-evaluation, and self-reinforcement (Ingham, Adams, & Reynolds, 1978). These components were incorporated into self-monitoring in the current study and likely contributed to the positive treatment effect.

Promoting Aphasics' Communicative Effectiveness (PACE) has also been shown to produce positive outcomes. PWAs have improved their communicative effectiveness following PACE as evidenced by increased use of compensatory strategies such as circumlocution and gestures when naming deficits occurred (Li, Kitselman, Dusatko, & Spinelli, 1988).

Discourse-level SFA, self-monitoring, and PACE were incorporated into independent conversation training with the PWA in the present study. These treatment methods have been shown to have positive effects on communicative effectiveness. The large magnitude of change in the current study is likely due to the combined treatment effect from these methods.

Treatment Block 2

In treatment block 2, direct conversation training with the PWA was withdrawn and the PWA's spouse received partner training to facilitate the PWA's communication. Following treatment, the PWA's spouse reported she was more intentional in arranging the environment to reduce distractions. For example, she would shut off the TV and make sure she was seated near the PWA when talking with him. In video-taped conversations between the PWA and the PWA's spouse, the number of times the spouse interrupted or corrected the PWA when the PWA's overall message was understood decreased. Following this block of treatment, the PWA showed significant declines in the cognitive areas of attention, memory, and visuospatial skills as well as in his quality of life. The PWA's language functions also declined following treatment block 2, specifically in the areas of auditory verbal comprehension and naming despite large gains in

these same areas following treatment block 1. This suggests that partner training alone is not effective in maintaining or increasing the gains seen following direct conversation training with the PWA. Therefore, direct conversation training with the PWA should be incorporated when training partners to maximize gains. Declines in scores may have occurred because of the withdrawal of conversation training with the PWA. The PWA did not receive any intervention during treatment block 2. Therefore, he was not receiving structured language and cognitive stimulation as he had been during treatment block 1. This likely contributed to declines seen in language and cognitive-linguistic skills. It might also suggest that a longer treatment period or a greater treatment intensity was needed to maintain gains seen following treatment block 1. The PWA's perceived quality of life also decreased compared to post-block 1 outcomes. However, the mean rating did not drop below baseline. The ability to communicate is an important factor in an individual's perceived quality of life (Simmons-Mackie, Savage, & Worrall, 2014). Therefore, decreases in language and cognitive-linguistic skills which impact an individual's ability to communicate may have contributed to declines seen in quality of life ratings. Significant declines may also have been due to participant fatigue during testing following treatment block 2. Due to scheduling difficulties, all assessments were administered over two, 90-minute treatment sessions. Following treatment block 1, assessments were administered over three, 60-minute treatment sessions. It is likely that the PWA experienced possible fatigue during testing after each treatment block but the degree of fatigue may have been greater following treatment block 2 due to the longer sessions. Results on the CLQT were most likely to have been influenced by the possible fatigue following treatment block 2 as the CLQT was administered toward the end of the session following other assessments. However, given the fact that the PWA's performance decreased across all other tests (especially the WAB-R and the ASHA

QCL), it is likely that he also may have regressed in his cognitive functions towards his initial post-injury plateaued performance.

Previous studies evaluating the effects of partner training have indicated that PWAs have shown increases in the number of verbal responses produced and in the length of verbal responses, increased verbal production of comprehensible utterances, enhanced communication skills needed for daily activities, and decreased aphasia severity following partner training. PWAs have also reported increased psychosocial wellbeing and confidence (Hickey, Bourgeois, & Olswang, 2004; McVicker, Parr, Pound, & Duchan, 2009; Simmons-Mackie, Kearns, & Potechin, 2005; Worrall & Yiu, 2000). The PWA in the present study did show improvements in communicative effectiveness for procedural discourse and a slight increase in social communication skills on the ASHA FACS following partner training. However, declines were seen in quality of life and communication for daily activities. These results provide some support for partner training, but conversation training with a PWA independent of partner training appears to be more effective than partner training alone. Discrepancies in outcomes from the current study compared to previous studies may have been due to differences in partner training programs used.

Maintenance

Assessments were re-administered four months following completion of treatment block 2 to evaluate maintenance of gains. The PWA showed a clinically significant decline in language skills on the WAB-R as evidenced by a 13.6 point decrease in AQ. Results also indicated a significant decline in scores in memory on the CLQT. Both measures dropped below pre-treatment baseline outcomes. Prior to the start of this study, the PWA attended individual and group therapy at the university clinic for four months. Pre-treatment baseline assessments were

administered following a one-month break from intervention. Pre-treatment baselines may have been influenced by these previous interventions. Follow-up assessments were administered seven months after the completion of any individual intervention. Therefore, the PWA had not received any structured language or cognitive stimulation for seven months at the time of follow-up testing, resulting in scores that fell below baseline. This also suggests that gains following treatment block 1 were not maintained. A longer treatment period or a greater treatment intensity may be needed to maintain these gains.

Limitations

Results from this study cannot be generalized readily as this study was a single-case study. PWAs are a diverse group of individuals, and a singular treatment method will not be effective with all individuals in the population. Results may not be generalizable to other PWAs with different types or severities of aphasia or with different time post-onset. In addition, the PWA had received group and individual intervention for four months prior to the start of this study. It is possible that outcomes from these interventions influenced pre-treatment baseline outcomes. In addition, the intensity and frequency of direct conversation training with the PWA in treatment block 1 was limited to two one-hour sessions a week for 10 weeks. A longer treatment period or a greater treatment intensity may have contributed to greater gains and/or maintenance of gains. Finally, participant fatigue during post-block 2 testing may have affected the PWA's performance on the CLQT, so it is unclear whether the cognitive declines observed following treatment block 2 were due to withdrawal of conversation training or to possible participant fatigue.

Recommendations for Future Research

Future research is needed to determine whether direct conversation training with a PWA is an effective treatment method for a variety of subjects. Future research should include larger sample sizes with PWAs with varying types and severities of aphasia. The order of treatment should be varied to determine the most effective combination of direct conversation training and partner training. This will allow researchers to determine if direct conversation training with a PWA would be a beneficial addition to partner training to improve outcomes and vice versa or if the order of treatment delivery affects outcomes. Future research should also increase the intensity and duration of treatment to determine if a more intense and longer treatment period would improve outcomes and maintain gains. If subjects have received previous therapy, a wash out period should be included before pre-treatment baseline measures are obtained. Other recommendations include comparing the effectiveness of group conversation training with a PWA to partner training in group settings instead of in one-on-one settings and using a different partner training program to train the PWA's spouse.

Conclusion

Results of the present study support previous research findings which indicate that direct conversation training with a PWA may lead to improvements in communication skills. However, the results also advance the findings of previous studies and demonstrate that conversation training can improve language functions, cognitive-linguistic skills, functional communication, and communicative effectiveness. Conversation training with a PWA is also effective in improving quality of life which is an important component of the Life Participation Approach to Aphasia (LPAA). Improvements in quality of life are also integral parts of the World Health Organization's International Classification of Functioning, Disability and Health (WHO ICF)

framework as well as the Living with Aphasia: Framework for Outcome Measurement (A-FROM) model. Conversation training with the PWA was shown to be more effective than partner training alone. Therefore, it is recommended that partner training does not occur in isolation and that direct conversation training with the PWA is included when training communication partners. Research should continue to explore the effectiveness of direct conversation training with PWAs with or without partner training to improve language and cognitive functions as well as quality of life in individuals with aphasia.

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Appendix A: IRB Approval

OFFICE OF RESEARCH AND SPONSORED PROGRAMS
ST. CLOUD STATE UNIVERSITY.

Institutional Review Board (IRB)

Administrative Services 210
Website: stcloudstate.edu/osp *Email: osp@stcloudstate.edu*
Phone: 320-308-4932

Name: Amanda Rumpca

Address

USA

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IRB PROTOCOL DETERMINATION: Expedited Review-2

Project Title: Conversation Training in Aphasia: A Single Case Study

Advisor Grama Rangamani

The Institutional Review Board has reviewed your protocol to conduct research involving human subjects. Your project has been: **APPROVED**

Please note the following important information concerning IRB projects:

- The principal investigator assumes the responsibilities for the protection of participants in this project. Any adverse events must be reported to the IRB as soon as possible (ex. research related injuries, harmful outcomes, significant withdrawal of subject population, etc.).

- For expedited or full board review, the principal investigator must submit a Continuing Review/Final Report form in advance of the expiration date indicated on this letter to report conclusion of the research or request an extension.

-Exempt review only requires the submission of a Continuring Review/Final Report form in advance of the expiration date indicated in this letter if an extension of time is needed.

- Approved consent forms display the official IRB stamp which documents approval and expiration dates. If a renewal is requested and approved, new consent forms will be officially stamped and reflect the new approval and expiration dates.

- The principal investigator must seek approval for any changes to the study (ex. research design, consent process, survey/interview instruments, funding source, etc.). The IRB reserves the right to review the research at any time.

Good luck on your research. If we can be of further assistance, please contact the Office of Research and Sponsored Programs at 320-308-4932 or email lidonnay@stcloudstate.edu. Use the SCSU IRB number listed on any forms submitted which relate to this project, or on any correspondence with the IRB.

Institutional Review Board:

Linda Donnay
IRB Administrator
Office of Research and Sponsored Programs

St. Cloud State University:

Marilyn Hart
Interim Associate Provost for Research
Dean of Graduate Studies

OFFICE USE ONLY

SCSU IRB# 1531 - 1905	**Type:** Expedited Review-2	**Today's Date:** 1/12/2016
1st Year Approval Date: 1/8/2016	**2nd Year Approval Date:**	**3rd Year Approval Date:**
1st Year Expiration Date: 1/7/2017	**2nd Year Expiration Date:**	**3rd Year Expiration Date:**

Appendix B: PWA Informed Consent Form

Conversation Training in Aphasia
Informed Consent

You are invited to participate in a study about conversation for people with aphasia because you receive services for aphasia at the St. Cloud State University Speech-Language and Hearing Clinic. This project is being done by Amanda Rumpca and Dr. Rangamani for a thesis project at St. Cloud State University.

Background Information and Purpose
This study will compare a conversation training program and a partner training program. The study will help speech-language therapists improve services for people with aphasia and their families.

Procedures
If you decide to participate, you will attend 2 one-hour sessions every week at the SCSU Speech-Language and Hearing Clinic. Therapy starts January 18, 2016 and ends on May 6, 2016. We will teach you how to improve your conversation skills. You will also complete several tests to measure your communication skills and quality of life.

Risks
There are no known risks to you for participating in this study.

Benefits
You will receive one-on-one therapy. This therapy may help to improve your ability to talk with others. It may also help you be more confident speaking to others and doing activities you enjoy.

Confidentiality
Your personal information will be kept confidential. Your name or other personal information will never be used. All your documents will be kept in a secure location. Your audio and video recordings may be used in St. Cloud State University classes to help students learn.

Research Results
We can give you the research results after the study is completed.

Contact Information
If you have any questions right now, please ask. If you have any questions later, you may contact Amanda Rumpca at amrumpca@stcloudstate.edu or Dr. Rangamani at 320-308-5769 or gnrangamani@stcloudstate.edu. We will give you a copy of this form for your records.

Participation/Withdrawal

Your participation is voluntary. If you decide not to participate, your relationship (present or future) with St. Cloud State University, the researcher, or the SCSU Speech-Language and Hearing Clinic will not be affected. If you decide not to participate, you can withdraw at any time without penalty.

Acceptance to Participate

Your signature indicates that you have read the information above and that you agree to participate. You may quit at any time even after signing this form.

_____ _____

Signature Date

Appendix C: Partner Informed Concent Form

Conversation Training in Aphasia
Informed Consent

You are invited to participate in a study about conversation for people with aphasia because your spouse receives services for aphasia at the St. Cloud State University Speech-Language and Hearing Clinic. This project is being done by Amanda Rumpca and Dr. Rangamani for a thesis project at St. Cloud State University.

Background Information and Purpose
This study will compare a conversation training program and a partner training program. The study will help speech-language therapists improve services for people with aphasia and their families.

Procedures
If you decide to participate, you will be asked to meet with the student researcher for approximately 15 hours at the SCSU Speech-Language and Hearing Clinic or in the community. You will be taught how to improve your conversation skills with your spouse.

Risks
There are no known risks to you by participating in this study.

Benefits
You will receive one-on-one training. This training may help you improve your ability to communicate with your spouse.

Confidentiality
Your personal information will be kept confidential. Your name or other personal information will never be used. All your documents will be kept in a secure location. Your audio and video recordings may be used in St. Cloud State University classes to help students learn.

Research Results
We can give you the research results after the study is completed.

Contact Information
If you have any questions right now, please ask. If you have any questions later, you may contact Amanda Rumpca at amrumpca@stcloudstate.edu or Dr. Rangamani at 320-308-5769 or gnrangamani@stcloudstate.edu. We will give you a copy of this form for your records.

Participation/Withdrawal
Your participation is voluntary. If you decide not to participate, your relationship (present or future) with St. Cloud State University, the researcher, or the SCSU Speech-Language and

Hearing Clinic will not be affected. If you decide not to participate, you can withdraw at any time without penalty.

Acceptance to Participate

Your signature indicates that you have read the information above and that you agree to participate. You may quit at any time even after signing this form.

_____ _____

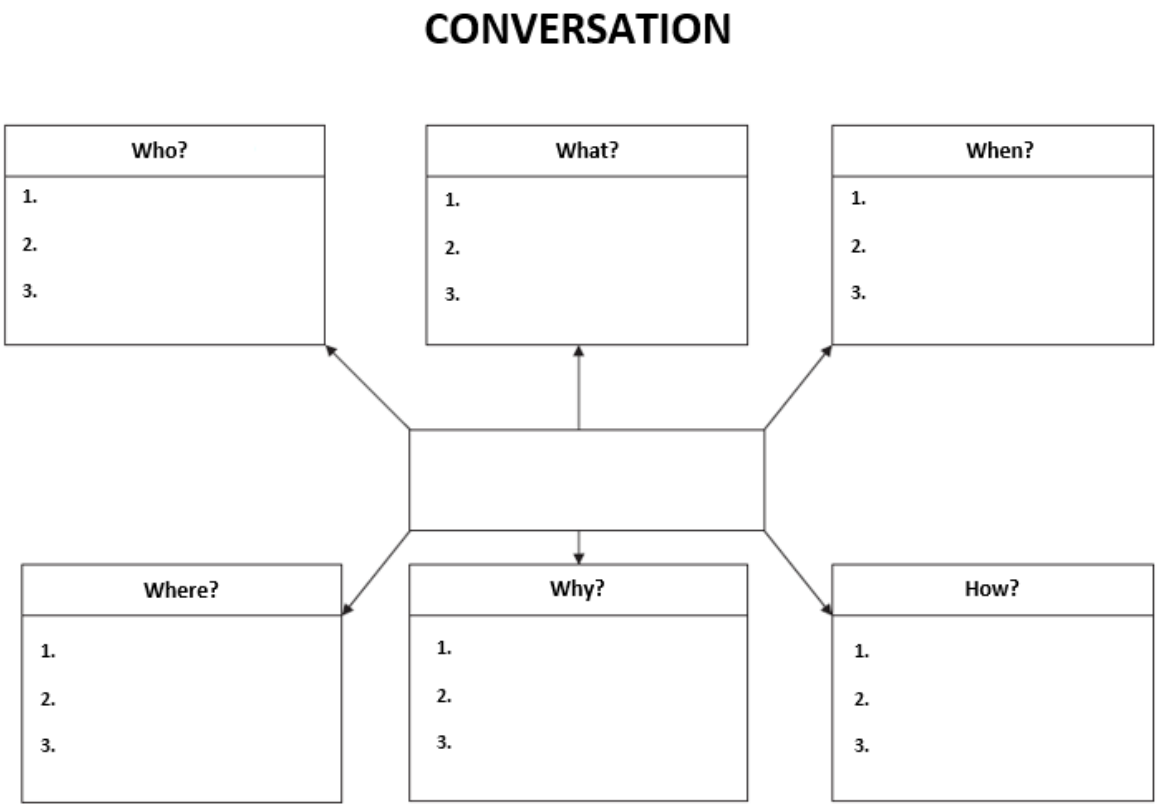
Signature Date

Appendix D: Support and Strain Scale

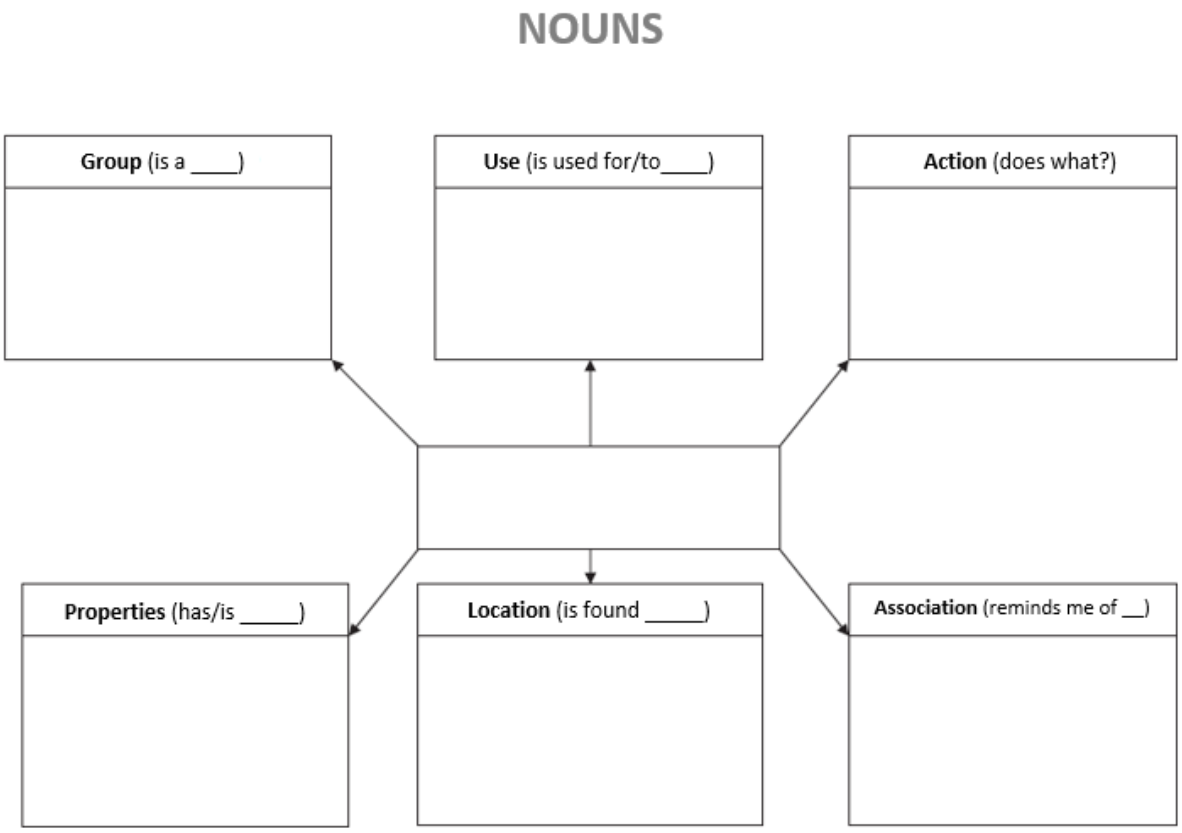
Social Support and Strain Scale Adapted from Walen & Lachman (2000)			
How much does your spouse understand the way you feel about things?			
1. A lot	2. Somewhat	3. Very little	4. Not at all
How much does your spouse really care about you?			
1. A lot	2. Somewhat	3. Very little	4. Not at all
How much can you rely on your spouse for help if you have a serious problem?			
1. A lot	2. Somewhat	3. Very little	4. Not at all
How much can you open up to your spouse if you need to talk about your worries?			
1. A lot	2. Somewhat	3. Very little	4. Not at all
How often does your spouse criticize you?			
1. Often	2. Sometimes	3. Rarely	4. Never
How often does your spouse make too many demands on you?			
1. Often	2. Sometimes	3. Rarely	4. Never
How often does your spouse let you down when you are counting on them?			
1. Often	2. Sometimes	3. Rarely	4. Never
How often does your spouse get on your nerves?			
1. Often	2. Sometimes	3. Rarely	4. Never

Walen, H. R. & Lachman, M. E. (2000). Support and strain from partner, family, and friends: Costs and benefits for men and women in adulthood. *Journal of Social and Personal Relationships, 17*(5), 5-30.

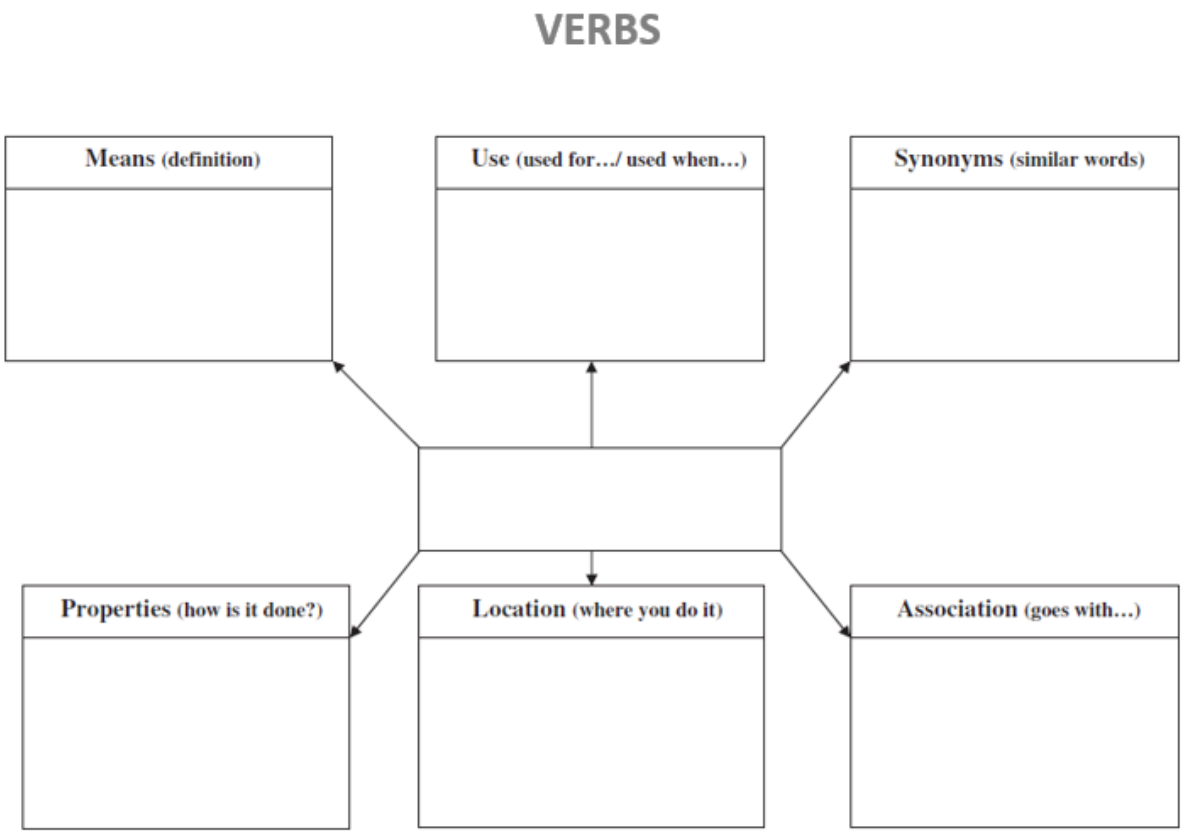
Appendix E: Discourse Map



Appendix F: Noun SFA Map



Appendix G: Verb SFA Map



Appendix H: CIRSAG Form

Communication Interaction Rating Scale for Aphasia Group (CIRSAG)

Communicator: _____ Context: _____

Rater(s): _____Date: _____

1. Overall, how much does the communicator **participate/engage** in conversation?

1	2	3	4	5	6	7
none			some			a lot
max support			mod support			independent

2. Overall how much does the communicator **comprehend** conversational topics or specific information given auditory and/or visual context in conversation?

1	2	3	4	5	6	7
none			some			a lot
max support			mod support			independent

3. How frequently does the communicator **take an active role (e.g., initiate)** in the interaction by asking questions, commenting, requesting interaction from others, or expression opinions?

1	2	3	4	5	6	7
never			sometimes			very often
max support			mod support			independent

4. How well does the communicator **convey specific ideas (e.g. generate semantic content)** when responding to questions, describing an event, instructing others, or tell stories via any modality?

1	2	3	4	5	6	7
poorly			fair to good			excellent
max support			mod support			independent

5. How frequently does the communicator use **alternate or multiple modalities** (e.g., speaking, writing, gesturing, facial expressions, intonation, pointing) or **different strategies** (e.g., reword, pausing to organize thoughts, indicating topic) when trying to get a message across?

1	2	3	4	5	6	7
never			sometimes			almost always
max support			mod support			independent

6. How often is the communicator able to **get a message across to a conversational partner (i.e., communicate successfully)** across modalities?

1	2	3	4	5	6	7
never			sometimes			almost always
max support			mod support			independent

7. How would you rate the communicator's **overall functional communication ability**?

1	2	3	4	5	6	7
poor			fair to good			excellent
max support			mod support			independent

*From Garrett, Staltari, Moir, & Sittner, 2006